Model Planter Optimization

MacKenzie Kelley
Physics, Chemistry, Engineering
Maquoketa High School
John Deere Seeding

Part I: Overview of Business

John Deere is a manufacturing company for agriculture, construction, & forestry machinery. The company began in 1837 by developing the first steel saw blade into a plow. Today John Deere is a global company with it's headquarters in Moline Illinois.

Part II: Job Specifics

Pro-Series XP Row Unit Planter. A full range of attachments and accessories allows you to tailor your planter to your specific soil types and residue levels, from no-till corn trash to sticky gumbo

MaxEmerge™XP units take rugged performance and long life to the next level. Extra productivity, extra precision, and extra profitability

ExactEmerge experience. 10mph planting that offers accurate singulation, population, spacing, and uniform depth so you can maximize your productivity and yield potential. Designed for corn and soybean varieties of all shapes and sizes, ExactEmerge is the row unit to push your profit

Part III: Introduce the Problem

John deere is looking to develop a planter that will exactly plant corn when traveling at a constant linear velocity to the following spefications:

Seed spacing: 16. cm

Height:: 56 cm

Part IV: Background

- Constant velocity

→ tumble buggy lab

- Free fall

→ free fall picket fence lab

- Projectile motion

→ projectile motion phet & practicum lab

- forces

→ friciton lab

Part V: Business Solution

Accuracy paired with speed, like you've never seen before. That's the ExactEmerge experience.ExactEmerge experience. 10mph planting that offers accurate singulation, population, spacing, and uniform depth so you can maximize your productivity and yield potential. Designed for corn and soybean varieties of all shapes and sizes,. The planter includes Brush Belt Delivery System, High-Performance Vacuum Meter, Brush-Style Doubles Eliminator, Dual Electric Motors, Seed Sensor.

Part VI: Student Solutions

→ model , that can drop the seed ***not in order**

- Identify the Problem
- Research
- propose possible solutions
- Concept downselect
- Build a Prototype
- Test Prototype
- Improve design as required
- implement